AMENDMENT

Please enter the following amendments:

IN THE CLAIMS

Claims 24-62 are canceled without prejudice or disclaimer. Claims 1, 3, 6, and 18 are amended.

Claims 63-100 are added. The following is a claim listing showing the claim status.

1. (currently amended) A microcombustor comprising:

a first section comprising a combustion fuel channel having an inlet for connecting the microcombustor to a combustion fuel source and an outlet at a top surface of said first section; and

a second section disposed next to the first section;

the second section comprising:

a combustion chamber having an inlet in fluid communication with the outlet of the channel of the first section and an outlet capable of evacuating combustion exhaust products; and

an exhaust channel having an inlet in fluid communication with the outlet of the combustion chamber and an outlet at a surface of said second section;

wherein the combustion fuel channel and the exhaust channel are disposed on a same side with respect to the combustion chamber, so as to form a first heat exchanger;

wherein the first section and the second section are separated by a first plate;

and further comprising a second plate disposed on the side of the second section opposite the first section; wherein the second plate defines one side of the combustion chamber;

wherein the combustion chamber comprises a combustion catalyst and a space separates the combustion catalyst and the second plate.

2. (original) The microcombustor of claim 1, wherein the combustion fuel channel and the

exhaust channel are disposed in planes substantially parallel to each other.

3. (currently amended) The microcombustor of claim 2, wherein the combustion fuel channel and the exhaust channel are adjacent and substantially parallel to each other.

4. (original) The microcombustor of claim 1, wherein a first heat transfer layer is disposed between the first section and the second section.

5. (original) The microcombustor of claim 4, wherein a second heat transfer layer is disposed on the second section.

6. (currently amended) The microcombustor of claim 1, wherein ~~a combustor catalyst is disposed in~~ the combustion chamber has a volume in the range of 0.02 and 0.002 ml.

7. (original) The microcombustor of claim 1, wherein a liquid evacuation system is disposed in the exhaust channel.

8. (original) The microcombustor of claim 7, wherein the liquid evacuation system comprises a wick.

9. (original) A fuel cell comprising the microcombustor of claim 1.

10. (original) A microcombustor comprising:

a gas inlet connected to a reaction chamber;

a liquid feed system connected to the inlet of the reaction chamber;

a reaction chamber having an internal volume of 100 mm^3 or less;

an outlet connected to the reaction chamber; and

a liquid evacuation system disposed in at least one of said inlet and said outlet, the liquid evaporation system comprising a wick, packed tube or capillary tube.

11. (original) A microcombustor according to claim 10, wherein the outlet has a length as least as long as its diameter.

12. (original) A microcombustor according to claim 10, wherein the outlet has a diameter that is no more than two times larger than the largest internal diameter of the reaction chamber; and at least one of the liquid feed system and the liquid evacuation system comprises a wick.

13. (original) A microcombustor according to claim 10, wherein wherein the outlet has a diameter that is no more than two times larger than the largest internal diameter of the reaction chamber; and at least one of the liquid feed system and the liquid evacuation system comprises a packed tube.

14. (original) A microcombustor according to claim 10, wherein wherein the outlet has a diameter that is no more than two times larger than the largest internal diameter of the reaction chamber; and at least one of the liquid feed system and the liquid evacuation system comprises a capillary tube.

15. (original) A fuel cell comprising the microcombustor of claim 10.

16. (original) A steam reformer, comprising

a microcombustor as defined in claim 1; and

a third section comprising a reformation channel having an inlet for supplying reformation fuel and an outlet for evacuating reformation products,

wherein the exhaust channel and at least a portion of the reformation channel are disposed on a same side with respect to the combustion chamber, so as to form a second heat exchanger.

17. (original) The steam reformer of claim 16, wherein the exhaust channel and the reformation channel are disposed in planes substantially parallel to each other.

18. (currently amended) The steam reformer of claim 17, wherein the exhaust channel and the reformation channel are adjacent and substantially parallel to each other; and wherein the reformation channel comprises a reforming catalyst.

19. (original) The steam reformer of claim 16, wherein a second heat transfer layer is disposed between the second and third layers.

20. (original) The steam reformer of claim 16, wherein a reformation catalyst is disposed in the reformation channel.

21. (original) The steam reformer of claim 16, wherein a liquid evacuation system is disposed in the exhaust channel.

22. (original) The steam reformer of claim 21, wherein the liquid evacuation system comprises a wick.

23. (original) A fuel cell comprising the steam reformer of claim 16.

24-62. (canceled)

63. (new) The microcombustor of claim 3 wherein the first section comprises a combustion

fuel tube and an air tube.

64. (new) The microcombustor of claim 3 wherein the combustion catalyst has a porosity of 30 to 95%.

65. (new) The microcombustor of claim 3 wherein the combustion catalyst comprises a metal foam or a metal felt.

66. (new) The microcombustor of claim 3 wherein the combustion catalyst has a thickness between 0.1 and 1 mm.

67. (new) The microcombustor of claim 3, wherein a liquid evacuation system is disposed in the exhaust channel.

68. (new) The microcombustor of claim 67, wherein the liquid evacuation system comprises a wick.

69. (new) A fuel cell comprising the microcombustor of claim 68.

70. (new) The microcombustor of claim 3, wherein the combustion catalyst has a pore volume of 5 to 98%

71. (new) The microcombustor of claim 67, wherein the combustion catalyst has a pore volume of 30 to 95% and at least 50% of the of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 μm.

72. (new) The microcombustor of claim 3, wherein at least 50% of the of the combustion catalyst's pore volume is composed of pores in the size range of 0.1 to 300 μm.

73. (new) The microcombustor of claim 3, wherein at least 20% of the of the combustion catalyst's pore volume is composed of pores in the size range of 1 to 100 μm.

74. (new) The microcombustor of claim 3, wherein the combustion chamber has a volume of 0.05 ml or less.

75. (new) The microcombustor of claim 1, wherein the combustion chamber has a volume of 0.05 ml or less.

76. (new) The microcombustor of claim 68, wherein the wick comprises fibers or foam.

77. (new) The microcombustor of claim 71, wherein the combustion chamber has a volume of 0.05 ml or less.

78. (new) The microcombustor of claim 73, wherein the combustion chamber has a volume of 0.05 ml or less.

79. (new) The microcombustor of claim 3, wherein the combustion chamber has a volume in the range of 0.02 and 0.002 ml.

80. (new) The microcombustor of claim 68, wherein the combustion chamber has a volume in the range of 0.02 and 0.002 ml.

81. (new) A microcombustor comprising:

a first section comprising a combustion fuel channel having an inlet for connecting the microcombustor to a combustion fuel source and an outlet at a top surface of said first section; and

a second section disposed next to the first section;

the second section comprising:

a combustion chamber having an inlet in fluid communication with the outlet of the channel of the first section and an outlet capable of evacuating combustion exhaust products; and

an exhaust channel having an inlet in fluid communication with the outlet of the combustion chamber and an outlet at a surface of said second section;

wherein the combustion fuel channel and the exhaust channel are disposed on a same side with respect to the combustion chamber, so as to form a first heat exchanger, and

wherein a liquid evaporation system is disposed in the exhaust channel.

82. (new) The microcombustor of claim 81 wherein the first section and the second section are separated by a first plate;

and further comprising a second plate disposed on the side of the second section opposite the first section; wherein the second plate defines one side of the combustion chamber;

wherein the combustion chamber comprises a combustion catalyst and a space separates the combustion catalyst and the second plate.

83. (new) The microcombustor of claim 81 wherein the liquid evaporation system comprises a wick.

84. (new) The microcombustor of claim 83 wherein the combustion fuel channel and the exhaust channel are adjacent and substantially parallel to each other; and wherein the exhaust channel comprises a microchannel.

85. (new) A steam reformer, comprising

a microcombustor as defined in claim 84; and

a third section comprising a reformation channel having an inlet for supplying

reformation fuel and an outlet for evacuating reformation products,

wherein the exhaust channel and at least a portion of the reformation channel are disposed on a same side with respect to the combustion chamber, so as to form a second heat exchanger.

86. (new) The steam reformer of claim 85 further comprising a wick to transport liquid into the reformation channel.

87. (new) The microcombustor of claim 84 wherein the wick comprises fibers or foam.

88. (new) The microcombustor of claim 18 wherein the catalyst in the reformation channel is selected from the group consisting of CuZnAl, Pd/ZnO, and supported Ru, Pt, and Rh catalysts.

89. (new) The microcombustor of claim 18 wherein the catalyst in the reformation channel comprises Pd/ZnO.

90. (new) The microcombustor of claim 18 wherein the catalyst in the reformation channel comprises a metal foam.

91. (new) The microcombustor of claim 85 wherein the catalyst in the reformation channel has a porosity of at least 80%.

92. (new) The microcombustor of claim 91 wherein the catalyst in the reformation channel comprises Pd.

93. (new) The microcombustor of claim 18 wherein the catalyst in the reformation

channel is disposed in a reforming chamber that is in thermal contact with the combustion chamber and wherein the reforming chamber has a volume of 0.05 ml or less.

94. (new) The steam reformer of claim 18 wherein the catalyst in the reformation channel has a pore volume of 5 to 98% and at least 20% of the of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 μm.

95. (new) The steam reformer of claim 85 wherein the catalyst in the reformation channel has a pore volume of 5 to 98% and at least 50% of the of the catalyst's pore volume is composed of pores in the size range of 0.3 to 200 μm.

96. (new) The steam reformer of claim 18 wherein the catalyst in the reformation channel has a specific activity of greater than 1.5 mol methanol converted/(g catalyst)(hour) when tested at 400 °C, 25 millisecond contact time, and a reactant stream of 1:8 water:methanol ratio.

97. (new) The steam reformer of claim 96 wherein the catalyst exhibits a pressure drop of less than 25 psig.

98. (new) The steam reformer of claim 85 wherein the catalyst in the reformation channel has a specific activity of greater than 2.5 mol methanol converted/(g catalyst)(hour) when tested at 400 °C, 25 millisecond contact time, and a reactant stream of 1:8 water:methanol ratio.

99. (new) The steam reformer of claim 18 having an overall volume of less than 0.5 ml.

100. (new) The steam reformer of claim 94 wherein the combustion catalyst has a pore

volume of 5 to 98% and at least 20% of the of the catalyst's pore volume is composed of pores in the size range of 0.1 to 300 μm.